

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants : Kie Y. Ahn and Leonard Forbes      Attorney Docket No.: 500466.03  
Filed : Concurrently herewith  
Title : FIELD EMISSION DISPLAY HAVING REDUCED POWER REQUIREMENTS AND  
METHOD

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**INFORMATION DISCLOSURE STATEMENT**

Mail Stop Patent Application  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with 37 C.F.R. §§ 1.56 and 1.97 through 1.98, applicants wish to make known to the Patent and Trademark Office the references set forth on the attached form PTO-1449. This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior Application No. 09/140,623, filed August 26, 1998. The references listed on the attached Form PTO-1449 were submitted to and/or cited by the Patent and Trademark Office in this prior application and, therefore, are not required to be provided in this application. If the Examiner wishes, copies will be provided upon request. Although the aforesaid references are made known to the Patent and Trademark Office in compliance with applicants' duty to disclose all information they are aware of which is believed relevant to the examination of the above-identified application, applicants believe that their invention is patentable.

Applicants also wish to make known to the Patent and Trademark Office that an application, Serial No. 09/994,511, describing and claiming subject matter that is similar to the subject matter of this application, was filed on November 26, 2001. This related application, which is a divisional of above-referenced Application No. 09/140,623, filed August 26, 1998, as well as any prior art cited therein, may be material to the examination of this application.

Please acknowledge receipt of this Information Disclosure Statement and kindly make the cited references of record in the above-identified application.

Respectfully submitted,

DORSEY & WHITNEY LLP

A handwritten signature in black ink, appearing to read "Steven Arterberry", written in a cursive style.

Steven H. Arterberry  
Registration No. 46,314

Enclosure:  
Form PTO-1449

1420 Fifth Avenue, Suite 3400  
Seattle, WA 98101-4010  
Telephone: (206) 903-8800  
Facsimile: (206) 903-8820

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FORM PTO-1449 (REV. 7-80)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. <b>500466.03</b>		APPLICATION NO. <b>not yet assigned</b>	
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U.S. PATENT DOCUMENTS							
*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	AA	3,665,241	05/23/72	Spindt et al.	313	351	
	AB	3,755,704	08/28/73	Spindt et al.	313	309	
	AC	3,812,559	05/28/74	Spindt et al.	29	25	
	AD	3,954,523	05/04/76	Magdo et al.	438	409	
	AE	4,016,017	04/05/77	Aboaf et al.	438	441	
	AF	4,266,233	05/05/81	Bertotti et al.	257	271	
	AG	4,652,467	03/24/87	Brinker et al.	427	246	
	AH	4,857,161	08/15/89	Borel et al.	445	24	
	AI	4,987,101	01/22/91	Kaanta et al.	438	619	
	AJ	5,103,288	04/07/92	Dakamoto et al.	257	758	
	AK	5,142,184	8/25/92	Kane	313	309	
	AL	5,186,670	02/16/93	Doan et al.	445	24	
	AM	5,194,780	3/16/93	Meyer	315	169.3	
	AN	5,229,331	07/20/93	Doan et al.	437	228	
	AO	5,259,799	11/09/93	Doan et al.	445	24	
	AP	5,358,908	10/25/94	Reinbert et al.	438	20	
	AQ	5,372,973	12/13/94	Doan et al.	437	228	
	AR	5,430,300	07/04/95	Yue et al.	445	50	
	AS	5,458,518	10/17/95	Lee	445	24	
	AT	5,470,801	11/28/95	Kapoor et al.	438	471	
	AU	5,473,222	12/05/95	Theony et al.	315	169.1	
	AV	5,483,067	01/09/96	Fujii et al.	250	338.3	
	AW	5,529,524	06/25/96	Jones	445	24	
	AX	5,569,058	10/29/96	Gnade et al.	445	24	
EXAMINER				DATE CONSIDERED			
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AY	5,578,896	11/26/96	Huang	313	309		
AZ	5,585,301	12/17/96	Lee et al.	437	60		
BA	5,597,444	01/28/97	Gilton	156	643		
BB	5,653,619	08/05/97	Cloud et al.	445	24		
BC	5,663,608	09/02/97	Jones et al.	313	309		
BD	5,684,356	11/04/97	Jeng et al.	445	70		
BE	5,712,534	1/27/98	Lee et al.	315	169.3		
BF	5,793,154	8/11/98	Itoh et al.	313	308		
BG	5,804,910	09/08/98	Tjaden et al.	313	310		
BH	5,853,492	12/29/98	Cathey et al.	134	3		
BI	5,869,169	02/09/99	Jones	428	213		
BJ	5,898,258	04/27/99	Sakai et al.	313	309		
BK	6,028,322	02/22/00	Moradi	257	10		
BL	6,232,705	05/15/01	Forbes et al.	313	309		
BM	6,251,470	06/26/01	Forbes et al.	427	97		
BN	6,255,156	07/03/01	Forbes et al.	438	235		
BO	6,277,765 B1	08/21/01	Cheng et al.	438	773		
BP	6,333,215 B1	12/25/01	Matsuda et al.	438	149		

  

FOREIGN PATENT DOCUMENTS							
DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION		
					YES	NO	
BQ							

  

OTHER PRIOR ART <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>	
BR	Anderson, R.C. et al., "Porous Polycrystalline Silicon: A New Material for MEMS," <i>Journal of Microelectromechanical Systems</i> 3(1):10-18, 1994
BS	Boswell, E.C. et al., "Polycrystalline Silicon Field Emitters," 8 <sup>th</sup> International Vacuum Microelectronics Conference Technical Digest, pp. 181-186, 1996

  

EXAMINER	DATE CONSIDERED
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<b>OTHER PRIOR ART</b> <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>					
	BT	Boswell, E.C. et al., "Polycrystalline silicon field emitters," <i>J Vac Sci Technol. B</i> 14(3):1910-1913, 1996			
	BU	Chalamala, Babu R. et al., "Fed Up with Fat Tubes," <i>IEEE Spectrum</i> , pp. 42-51, April 1998			
	BV	Huang, W.N. et al., "Photoluminescence in porous sputtered polysilicon films formed by chemical etching," <i>Semicond. Sci. Technol.</i> 12:228-233, 1997			
	BW	Huang, W.N. et al., "Properties of chemically etched porous polycrystalline silicon deposited by r.f. sputtering," <i>IEEE Hong Kong Electron Devices Meeting</i> , pp. 21-24, 1996			
	BX	Huq, S.E. et al., "Comparative study of gated single crystal silicon and polysilicon field emitters," <i>J. Vac. Sci. Technol. B</i> 15(6):2855-2858, 1997			
	BY	Huq, S.E. et al., "Fabrication of Gated Polycrystalline Silicon Field Emitters," 9 <sup>th</sup> International Vacuum Microelectronics Conference, St. Petersburg, pp. 367-370, 1996			
	BZ	Kim, I.H. et al., "Metal FEAs on Double Layer Structure of Polycrystalline Silicon," 9 <sup>th</sup> International Vacuum Microelectronics Conference, St. Petersburg, pp. 423-426, 1996			
	CA	Kim, I.H. et al., "Fabrication of metal field emitter arrays on polycrystalline silicon," <i>J. Vac. Sci. Technol. B</i> 15(2):468-471, 1997			
	CB	Ku, T.K. et al., "Enhanced Electron Emission from Phosphorus-Doped Diamond-Clad Silicon Field Emitter Arrays," <i>IEEE Electron Device Letters</i> 17(5):208-210, 1996			
	CC	Lacher, F. et al., "Electron field emission from thin fine-grained CVD diamond films," <i>Diamond and Related Materials</i> 6:1111-1116, 1997			
	CD	Lazarouk, S. et al., "Electrical characterization of visible emitting electroluminescent Schottky diodes based on n-type porous silicon and on highly doped n-type porous polysilicon," <i>Journal of Non-Crystalline Solids</i> 198-200:973-976, 1996			
	CE	Lee, J.H. et al., "A New Fabrication Method of Silicon Field Emitter Array with Local Oxidation of Polysilicon and Chemical-Mechanical-Polishing," 9 <sup>th</sup> International Vacuum Microelectronics Conference, St. Petersburg, pp. 415-418, 1996			
	CF	Lee, K.R. et al., "Field emission behavior of (nitrogen incorporated) diamond-like carbon films," <i>Thin Solid Films</i> 290-291:171-175, 1996			
	CG	Litovchenko, V.G. et al., "Emission Properties of the Silicon Cathodes Coated with Doped Diamond-Like Carbon Films," <i>IEEE International Conf. On Plasma Science</i> , p. 308, Abstract 7A02, 1997			
	CH	Nunes de Carvalho, C. et al., "Improvement of the Ito-P Interface in a Si:H Solar Cells Using a Thin SiO Intermediate Layer", <i>Mat. Res. Soc. Symp. Proc.</i> , 420:861-865, 1996			
	CI	Pullen, S.E. et al., "Enhanced Field Emission from Polysilicon Emitters Using Porous Silicon," 9 <sup>th</sup> International Vacuum Microelectronics Conference, St. Petersburg, pp. 211-214, 1996			
	CJ	Stevenson, I.C. et al., "Production of SiO <sub>2</sub> Films Over Large Substrate Area by Ion-Assisted Deposition of SiO with a Cold Cathode Source", <i>Soc. of Vac. Coaters, Proc. 36<sup>th</sup> Annual Tech. Conf.</i> , pp. 88-93, 1993			
	CK	Uh, H.S. et al., "Enhanced Electron Emission and Its Stability from Gated Mo-polycide Field Emitters," <i>IEEE</i> , pp. 713-716, 1997			
	CL	Uh, H.S. et al., "Fabrication and Characterization of Gated n+ Polycrystalline Silicon Field Emitter Arrays," 9 <sup>th</sup> International Vacuum Microelectronics Conference, St. Petersburg, pp. 419-422, 1996			
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CM	Uh, H.S., "Process design and emission properties of gated n+ polycrystalline silicon field emitter arrays for flat-panel display applications," <i>J. Vac. Sci. Technol. B</i> 15(2):472-476, 1997	
CN	Vaudaine, P. and Meyer, R., "Microtips Fluorescent Display," technical digest of IEDM 91, pp. 197-200, 1991	
CO	Zaidi, S.Z.A. et al., "Conduction Mechanisms in Co-Evaporated Mixed Mn/SiO <sub>x</sub> Thin Films", <i>Journal of Materials Science</i> , 32:3349-3353, 1997	
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